

## The illusion of conventional histological resection margin control

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DEAR EDITOR, An advantage of surgical treatment for basal cell carcinoma (BCC) over other therapeutic options is the possibility of histological margin control. The general understanding is that only 1–2% of the actual margins is checked histologically using the 'bread-loaf' or step sectioning technique for conventional excision specimens, but the percentage of resection margins that are microscopically evaluated has not actually been quantified to date.<sup>1,2</sup> This study's objective was to calculate the mean percentage of resection margins of BCC excision specimens that is histologically evaluated.

In a retrospective observational study, 20 excision specimens of BCCs, obtained in March 2018 in an academic hospital (Maastricht UMC+), were evaluated. Ten specimens had a maximum diameter < 2 cm and 10 were > 2 cm (overall range 0.4–5 cm). All BCCs were surgically excised in an ellipse. At the laboratory, the clinically visible lesion, length, depth and broadest width of the specimen were measured. An experienced laboratory analyst subsequently cut the specimens manually using the 'bread-loaf' technique: both tail-ends and the remaining part of the specimen were cut transversally at 2- to 3-mm intervals (Fig. 1). Depending on the length of the specimen, the number of segments cut ranged from four to 19. All segments were put in cassettes and embedded in paraffin. Of every segment, two to three samples of 3-µm thickness were placed onto microscopic slides for haematoxylin and eosin staining (seven to 43 samples per specimen).

The surface of the entire specimen (both sides and the deep plane) was calculated as well as the outer surface of the samples on the microscope slides. From these calculations, the mean percentage of the resection margin that was histologically evaluated was derived (formulas used and a calculation example are available on request).

The mean  $\pm$  SD percentage of resection margins that were histologically evaluated was  $0.19 \pm 0.08\%$ , ranging from 0.09% to 0.42%. This percentage is lower than the previously reported 1–2%.<sup>1,2</sup> 0.19% may seem too low to conclude that the excision is complete. However, it may be sufficient if evaluation of the resection margin covers the entire specimen – for example not only the middle part – and thus ensures that the sampling frequency is high enough for a confident diagnosis that the margin is clear. Using the 'bread-loaf' technique implies sampling at various locations throughout the entire

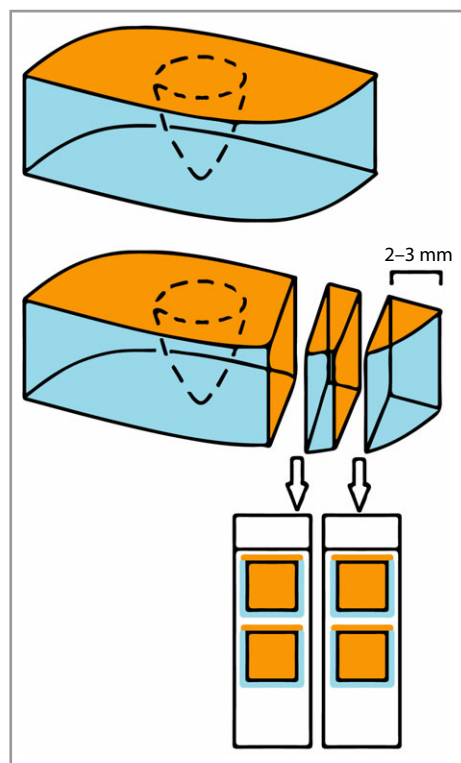


Fig 1. Elliptic excision specimen of basal cell carcinoma (BCC), processed with the 'bread-loaf' technique. The two lateral sides and deep surfaces (in blue) are the resection margins of the excision specimen. After step sectioning and sampling of microscopic slides, the borders that are evaluated for residual tumour are shown in blue. The dashed line schematically represents the BCC.



specimen; in those circumstances a percentage of 0.19% might suffice in the majority of cases.


We know that with positive histological margins after excision, fewer than half of BCCs recur. However, the proportion of recurrences is higher after an incomplete excision compared with a complete excision.<sup>3,4</sup> The use of 'bread-loafing' with selective checking of a limited number of samples is probably not a problem for low-risk BCCs, but it might be the cause of a greater number of recurrences after conventional surgical excision of high-risk BCCs.<sup>3,5</sup>

Our calculations are applicable to excision specimens of keratinocyte carcinomas after conventional excision in the Maastricht UMC+, but might not be generalizable to all excision specimens and all pathology laboratories for several reasons. First of all, pigmented lesions are processed and sliced in a different manner. Secondly, the calculation is based on

histological examination using the 'bread-loaf' technique; not all pathology laboratories might use the same sectioning technique, although 'bread-loafing' is the most commonly used technique.<sup>6</sup> Furthermore, for large excision specimens that do not fit the cassettes the cutting technique can differ.<sup>7</sup> Lastly, our dermatology and pathology departments are specialized in skin cancer care; it is possible that in other laboratories an even smaller part of the resection margin is checked.

We conclude that less than 0.5% of the resection margins is histologically checked for residual BCC after conventional excision. We aimed at quantifying the mean percentage of evaluated margins for future reference, to raise awareness of the low volume of checked resection margins and the need for a sampling technique that covers the entire excision specimen. The literature reports high clearance rates for surgical treatment.<sup>8</sup> However, the low percentage of checked margins is not acceptable in high-risk BCCs, in which case three-dimensional histology like Mohs micrographic surgery is preferable.<sup>7</sup>

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